

FORM PTO-1390 (REV. 12-2001)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 34307
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 10/031973
INTERNATIONAL APPLICATION NO. PCT/JP99/05410	INTERNATIONAL FILING DATE 01 October 1999	PRIORITY DATE CLAIMED 29 July 1999	
TITLE OF INVENTION ELECTRICALLY POWERED ROLLER MASSAGING IMPLEMENT			
APPLICANT(S) FOR DO/EO/US TAKAMURA, Shigeo			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).</p> <p>a. <input checked="" type="checkbox"/> is attached hereto.</p> <p>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> have been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</p> <p>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11 to 20 below concern document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment.</p> <p>14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</p>			

U.S. APPLICATION NO. 10/031973 INTERNATIONAL APPLICATION NO. PCT/JP99/05410		ATTORNEY'S DOCKET NUMBER 34307																																																																			
<p>21. <input checked="" type="checkbox"/> The following fees are submitted:</p> <p>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00</p> <p>International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00</p> <p>International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00</p> <p>ENTER APPROPRIATE BASIC FEE AMOUNT =</p> <p>Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).</p> <table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 20%;">CLAIMS</th><th style="width: 20%;">NUMBER FILED</th><th style="width: 20%;">NUMBER EXTRA</th><th style="width: 20%;">RATE</th><th style="width: 20%;">\$</th></tr></thead><tbody><tr><td>Total claims</td><td>- 20 =</td><td></td><td>x \$18.00</td><td>\$</td></tr><tr><td>Independent claims</td><td>- 3 =</td><td></td><td>x \$84.00</td><td>\$</td></tr><tr><td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td><td>+ \$280.00</td><td>\$</td></tr><tr><td colspan="4" style="text-align: right;">TOTAL OF ABOVE CALCULATIONS =</td><td>\$ 1,020.00</td></tr><tr><td colspan="4" rowspan="2"><input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.</td><td>\$</td></tr><tr><td>\$ 510.00</td></tr><tr><td colspan="4" style="text-align: right;">SUBTOTAL =</td><td>\$ 510.00</td></tr><tr><td colspan="4" rowspan="2">Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).</td><td>\$</td></tr><tr><td>\$</td></tr><tr><td colspan="4" style="text-align: right;">TOTAL NATIONAL FEE =</td><td>\$ 510.00</td></tr><tr><td colspan="4" rowspan="2">Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +</td><td>\$</td></tr><tr><td>\$</td></tr><tr><td colspan="4" style="text-align: right;">TOTAL FEES ENCLOSED =</td><td>\$ 510.00</td></tr><tr><td colspan="4" rowspan="2"></td><td>Amount to be refunded:</td><td>\$</td></tr><tr><td>charged:</td><td>\$</td></tr></tbody></table>		CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	Total claims	- 20 =		x \$18.00	\$	Independent claims	- 3 =		x \$84.00	\$	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$280.00	\$	TOTAL OF ABOVE CALCULATIONS =				\$ 1,020.00	<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$	\$ 510.00	SUBTOTAL =				\$ 510.00	Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	\$	TOTAL NATIONAL FEE =				\$ 510.00	Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	\$	TOTAL FEES ENCLOSED =				\$ 510.00					Amount to be refunded:	\$	charged:	\$	CALCULATIONS PTO USE ONLY	
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a. ☒ A check in the amount of \$ 510.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 16-0820. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card
information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
1.494 or (b)) must be filed and granted to restore the application to pending status.

10/031973
531 Rec'd PCT/PT. 24 JAN 2002

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Shigeo Takamura
Title: ELECTRICALLY POWERED ROLLER MASSAGING
IMPLEMENT
Docket No.: 34307

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to the examination of the above-identified patent application, it is requested that the following amendments be made.

IN THE CLAIMS:

Please amend claims 4 - 7 to read as follows.

1 4. (amended) A unit-type roller drive device for
2 motor-driven roller massage actions according to claim 1,
3 wherein sensors to vary the turning direction of the
4 drive motor is provided on one side edge portion of the
5 frame in the vicinity of the upper and lower shafts.

1 5. (amended) A motor-driven roller massage
2 instrument, comprising:
3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible

6 blade piece portions formed on the left and right sides
7 of said concave portion; and
8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;
11 wherein the roller drive device according to claim
12 1, is installed in said concave portion for installation
13 of the roller drive device.

1 6. (amended) A motor-driven roller massage
2 instrument, comprising:
3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and
5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;
8 wherein the roller drive device according to claim
9 1, is installed in said concave portions.

1 7. (amended) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:
3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;

6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 1, is installed in said concave portions.

Please add the following claims 8 - 18.

1 8. (new) A unit-type roller drive device for motor-
2 driven roller massage actions according to claim 2,
3 wherein sensors to vary the turning direction of the
4 drive motor is provided on one side edge portion of the
5 frame in the vicinity of the upper and lower shafts.

1 9. (new) A unit-type roller drive device for motor-
2 driven roller massage actions according to claim 3,
3 wherein sensors to vary the turning direction of the
4 drive motor is provided on one side edge portion of the
5 frame in the vicinity of the upper and lower shafts.

1 10. (new) A motor-driven roller massage instrument,
2 comprising:

3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible
6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 2, is installed in said concave portion for installation
13 of the roller drive device.

1 11. (new) A motor-driven roller massage instrument,
2 comprising:

3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible
6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 3, is installed in said concave portion for installation
13 of the roller drive device.

1 12. (new) A motor-driven roller massage instrument,
2 comprising:

3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible

6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 4, is installed in said concave portion for installation
13 of the roller drive device.

1 13. (new) A motor-driven roller massage instrument,
2 comprising:
3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and

5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;

8 wherein the roller drive device according to claim
9 2, is installed in said concave portions.

1 14. (new) A motor-driven roller massage instrument,
2 comprising:

3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and

5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;

8 wherein the roller drive device according to claim
9 3, is installed in said concave portions.

1 15. (new) A motor-driven roller massage instrument,
2 comprising:

3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and

5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;

8 wherein the roller drive device according to claim
9 4, is installed in said concave portions.

1 16. (new) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:

3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;

6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;

9 wherein the roller drive device according to claim
10 2, is installed in said concave portions.

1 17. (new) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:

3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;
6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 3, is installed in said concave portions.

1 18. (new) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:
3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;
6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 4, is installed in said concave portions.

REMARKS

The foregoing amendments corrects multiple claim dependency for purposes of calculating the claim fee.

Attached hereto are pages entitled "Version With Markings to Show Changes Made".

If there are any further fees required by this amendment not covered by an enclosed check, or if no check is enclosed, please charge the same to Deposit Account No. 16-0820, Order No. 34307.

Respectfully submitted,

By: 
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Suite 1200
Cleveland, Ohio 44114-1484
(216) 579-1700

January 24, 2002

"VERSION WITH MARKINGS TO SHOW CHANGES MADE"IN THE CLAIMS:

Claims 4 - 7 have been amended in the following manner.

1 4. (amended) A unit-type roller drive device for
2 motor-driven roller massage actions according to claim 1,
3 [2 or 3,] wherein sensors to vary the turning direction
4 of the drive motor is provided on one side edge portion
5 of the frame in the vicinity of the upper and lower
6 shafts.

1 5. (amended) A motor-driven roller massage
2 instrument, comprising:
3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible
6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 1, [2, 3 or 4] is installed in said concave portion for
13 installation of the roller drive device.

1 6. (amended) A motor-driven roller massage
2 instrument, comprising:
3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and
5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;
8 wherein the roller drive device according to claim
9 1, [2, 3 or 4] is installed in said concave portions.

1 7. (amended) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:
3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;
6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 1, [2, 3 or 4] is installed in said concave portions.

Claims 8 - 18 have been added and no marked-up
version is required.

11/PRTS

10/031973
1531 Rec'd PCT/F. 24 JAN 2002

SPECIFICATION

MOTOR-DRIVEN ROLLER MASSAGE INSTRUMENT

5 [Technical Field]

This invention relates to a unit-type roller drive device for motor-driven roller massage actions based on the actuation of guide slit-type roller chains for use in massaging the user back through the action of pressing against one's waist, back
10 and scruff of the neck, and also to a motor-driven roller massage instrument mounted with such a unit-type roller drive device.

[Background Art]

In the prior art, there is a motor-driven roller massage
15 instrument of a mat type having a size as long as the whole human body. A power transmission device portion of the above motor-driven roller massage instrument has left and right roller travel guide rails respectively incorporating stainless steel belts of a size as long as the whole human body. A single drive
20 source motor is installed on one end side of the guide rails, and a roller is mounted to the motor to mount a motor-driven roller travel belt to the roller axially. Then, a receiving box for taken-up belt and a single drive source motor are required for a set of a starting mechanism and a terminating mechanism of
25 the roller travel belt. Therefore, a double belt structure for forward and backward traveling is applied to the roller travel belt, which needs traveling from the starting mechanism to the terminating mechanism via a turn-back mechanism (due to the

use of the single motor). For that reason, a structure of a so-called double structure power transmission device of the roller travel belt has been in use. That is, the repetitive forward and backward traveling is required for the roller travel belt, whenever this roller travel belt is received in an empty box for taken-up belt after traveling from the terminating mechanism to the starting mechanism via the turn-back mechanism in succession to the above traveling.

On the other hand, there is a device having a roller massage device incorporated only in the back portion. This device is of a type, in which a longitudinally spiral shaft is mounted to the back portion, and a massaging ball roller portion is mounted pivotally to the spiral shaft to rotate massaging ball rollers vertically in cooperation with the rotation of the spiral shaft.

However, the above motor-driven roller massage instrument in the prior art requires the stainless steel belt to ensure a certain degree of strength and elasticity, since it is necessary to mount the roller travel belt of a size as long as the whole human body. The accurate installation of guide rails or the like is also required to prevent the stainless steel belt from being twisted or crossed and so on in the course of traveling, together with a large number of auxiliary portions other than the guide rails. The receiving box for taken-up belt is further required due to the application of a belt take-up mode. For that reason, there is a need for complicated, large-volume, heavyweight mechanism, resulting in an increase of manufacture cost.

Further, a product in the prior art incorporating the drive device of a roller massage instrument into the back of a chair needs to have a thick seat portion and so on, since a large-sized motor is installed in the seat portion. For that reason, the
5 above product results in an increase in size and weight as a whole, and thus finds difficulty in movement.

In view of the above circumstances, a mechanically-simple, trouble-free, low-cost, versatile motor-driven roller massage instrument (See Japanese Patent Application Nos. 10-
10 193605 and 10-193609) was developed by the present applicants for application to keep the ideal figure with a stretch of the line of the backbone naturally.

An object of the present invention is to provide a more simple compact roller drive device for more certain smooth
15 driving of a motor-driven roller massage instrument than the previously applied invention, and also to provide a motor-driven roller massage instrument mounted with such a roller drive device.

20 [Disclosure of the Invention]

There is provided a roller drive device of a size as approximately high as the back of the human body. The roller drive device has a frame composed of a base portion and left and right edge portions standing upright from the left and right
25 edges of the base portion, and a longitudinal guide slit is provided in each of the left and right edge portions of the frame. A shaft having a gear is mounted to each of the upper and lower ends of the frame, and a roller chain is mounted in a ring shape

round the upper and lower shafts in meshing with the gears. A shaft bushing fixed to massaging ball rollers is mounted to each roller chain, and the left and right ends of the shaft bushings are mounted in the guide slits in an inserted state. With the
5 above structure, the roller chains are moved vertically by rotation of the shafts with a drive motor, and in cooperation with the vertical movement of the roller chains, the massaging ball rollers are guided in accordance with the guide slits for vertical movement. There are also provided a motor-driven
10 roller massaging instrument and a legless chair respectively mounted with such a roller drive device.

[Brief Description of the Drawings]

Fig. 1 is a front view showing a roller massaging device
15 according to the present invention;

Fig. 2 is a left side view showing the same;

Fig. 3 is a front central longitudinal cross-sectional view showing the same;

Fig. 4 is a fragmentary perspective view showing a
20 massaging roller mount portion;

Fig. 5 is a fragmentary sectional view showing the massaging roller mount portion;

Fig. 6 is a left side view showing another embodiment of a guide slit;

25 Fig. 7 is a front view showing a motor-driven roller massaging instrument according to the present invention;

Fig. 8 is a front perspective view showing the motor-driven roller massaging instrument;

Fig. 9 is a back perspective view showing the motor-driven roller massage instrument;

Fig. 10 is a perspective view showing a frame of a motor-driven roller massage instrument according to another embodiment; and

Fig. 11 is a perspective view showing a frame of a legless chair mounted with a motor-driven roller massage instrument.

[Best mode for Carrying out the Invention]

Hereinafter will be described the present invention on the basis of illustrated embodiments. Reference numeral 1 denotes a roller drive device according to the present invention. The roller drive device 1 has a size as approximately high as the back of the human body and is structured to move massaging ball rollers 3 mounted to roller chains 2 vertically in cooperation with the vertical movement of the roller chains 2.

A description of the roller drive device 1 will be given in more details. Reference numeral 4 denotes a frame, which houses the whole roller drive device 1. The frame 4 is formed in a channel-like plate shape by a lengthwise rectangular plate-shaped base portion 4a and left and right edge portions 4b, 4b standing upright from the left and right edges of the base portion along the longitudinal direction thereof. The left and right edge portions 4b, 4b are respectively provided with longitudinal (vertical) guide slits 4c. As shown in Fig. 2, each guide slit 4c is curved gently (as seen from the front) so as to make a dent in its intermediate portion, and is therefore adapted to a back curve natural for aged users as well.

Incidentally, it is to be understood that each guide slit 4c might be curved in a desired shape as one like the letter S, which makes it possible to keep the ideal figure, as shown in Fig. 6, for instance, without being limited to the above embodiment.

5 The massaging ball rollers 3 are guided in accordance with each guide slit 4c through a shaft bushing 5 for vertical movement. Each shaft bushing 5 has a rectangular plate-shaped base portion 5a and a triangular rising piece 5b extending from the inner edge of the surface of the base portion
10 5a, and two pieces of pins 6 are projecting from the back of the base portion 5a outwardly. Then, a rotatable guide roller 7 is mounted to the end of each of the two pieces of pins 6. The guide rollers 7 are mounted in an inserted state in each guide slit 4c, and the massaging ball rollers 3 are mounted in a
15 rotatable state to the top end of each rising piece 5b through a massaging ball roller mount piece 8.

The massaging ball roller mount piece 8 is formed in a shape like the letter V and is mounted in a pivotal state to each rising piece 5b. The massaging ball roller mount piece 8 has a
20 stopper 8a projecting outwardly from each of side pieces inclined in two directions, and contact of each stopper 8a with the rising piece 5b makes it possible to prevent the excessive downward movement of the massaging ball rollers. Then, the massaging ball rollers 3 are mounted respectively to the left and
25 right top ends of each massaging ball roller mount piece 8 for appropriately longitudinal movement. There are two massaging ball rollers 3 along the inside of each of the left and right edge portions 4b, 4b of the frame 4. The left and right

massaging ball rollers 3, 3 are connected together through a shaft 9 mounted across the massaging ball roller mount pieces 8, 8. Incidentally, it is to be understood that the massaging ball roller mount pieces 8 might be modified (not shown) and so on for installation of one or a plurality of massaging ball rollers 3 other than two, without being limited to two massaging ball rollers on each side.

The opposite ends of each roller chain 2 mounted in a ring-shape are fixed in a ring shape to the base portion 5a of each shaft bushing 5. Each roller chain 2 is mounted tensely in a ring shape round gears 12, 12 (corresponding to pulleys) mounted to shafts 10, 11 respectively mounted across the upper ends and the lower ends of the side edge portions 4b of the frame 4. Then, a drive motor 13 is mounted to the center of the lower end of the base portion 4a of the frame 4. The motor 13 provides slowing-down rotation to the shaft 11 through a bevel gear 14 mounted to a shaft 13a projecting downward from the drive motor 13 and a bevel gear 15 mounted to the shaft 11. With the rotation of the shaft 11, the gears 12 mounted to the left and right ends of the shaft 11 are rotated to move the roller chains 2 and the massaging ball rollers 3 vertically. Sensors 16 to vary the turning direction of the motor 13 are mounted to one side edge portion 4b in the vicinity of the upper and lower shafts 10, 11 of the side edge portions 4b of the frame 4, permitting the repetitive forward and backward movement of the massaging ball rollers 3. Projections 18 respectively having machine screw holes are also provided in the side edge portions 4b for mounting a cover 17 for protection of the roller chains 2.

The above roller drive device 1 according to the present invention is used as a unit incorporated constantly into the back of an appliance such as the seats of chairs, trains, planes and automobiles, for instance, or alternatively, may be applied as an
 5 independently available motor-driven roller massage instrument.

Figs. 7 to 9 show one embodiment of the motor-driven roller massage instrument incorporating the above roller drive device 1. Reference numeral 19 denotes a back base body, and
 10 the back base body 19 is formed of hard synthetic resin in a forwardly curved bucket-like shape of a size as approximately high as the back of the human body. The back base body has a widthwise central concave portion 20 extending from the upper end to the lower end of the back base body for installation of the
 15 roller drive device. The back base body also has outwardly-expanded left and right blade piece portions 21, 21 on the left and right sides of the back base body in the range of their intermediate portions to their lower ends. These left and right blade piece portions 21, 21 are thinner than the other portion to
 20 offer flexibility. Further, the roller drive device 1 is incorporated into the concave portion 20 for installation of the roller drive device.

The left and right blade piece portions 21, 21 of the back base body 19 have belts 19a for fastening the human body to the
 25 back base body 19 and belts 19b for fastening the back base body 19 to the seat of chair or automobile or like appliance.

In Figs. 8 and 9, a reference numeral 22 denotes a surface cover for covering the whole back base body 10 incorporating the

roller drive device 1. The surface cover 22 has left and right insertion slits for allowing the fastening belts 19a, 19b to pull out to the outside, and a fastener 23 is mounted to each of the left and right insertion slits. A longitudinal fastener 24 is also
 5 provided in the widthwise center of the surface cover for allowing the easy detachment of the cover.

In use, the motor-driven roller massage instrument incorporating the roller drive device 1 according to the present invention as described above is fastened to the other appliance
 10 with the fastening belts 19b (or allows to remain as it is when the other appliance is not in use). Then, the left and right blade piece portions 19, 19 are further curved to be fit to the user body, and in this state, the user body is fastened with the fastening belts. Thereafter, turning the switch of the drive
 15 motor ON allows the roller drive device 1 to drive for gradually vertical movement of the roller chains 2. In cooperation with the vertical movement of the roller chains, the massaging ball rollers 3 make roller massaging actions by pressing against the user back ranging from the scruff of the neck to the waist in
 20 sequence according to a guided curve along the guide slits 4c. Incidentally, the same may be said of the operation of the roller drive device 1 when incorporated as the unit into the other appliance.

Fig. 10 shows a frame of a motor-driven roller massage
 25 instrument 25 according to another embodiment. The motor-driven roller massage instrument 25 has an outside frame 26 formed by bending a steel pipe into a shape approximately similar to the outside shape of the above back base body 19 so as

to surround the motor-driven roller massage instrument on all sides. Further, upper and lower lateral rods 26a, 26a made of band steel for supporting the upper and lower sides of a drive device are mounted across the left and right sides of the outside frame 26. The center of each of the upper and lower lateral rods 26a, 26a has a trapezoidal concave portion of a size as approximately wide as the roller drive device 1. Thus, the roller drive device 1 is mounted to the concave portions and is covered with the surface cover through a cushioning material such as a polyurethane foam material.

Fig.11 shows a frame of a legless chair 27 mounted with the motor-driven roller massage instrument. An outside frame 28a of a back portion 28 of the legless chair 27 is formed by bending a steel pipe so as to surround the back portion including no lower side corresponding to the lower side portion of the outside frame 26 of the motor-driven roller massage instrument 25. Similarly to the embodiment shown in Fig. 10, upper and lower lateral rods 28b, 28b are mounted across the left and right sides of the outside frame 28a, and the roller drive device 1 is mounted to a concave portion of each of the upper and lower lateral rods 28b. An outside frame 29a of a seat portion 29 is formed by bending a steel pipe in a rectangular frame shape, and rotatable connecting projections 29b are projecting from the opposite rear ends of the outside frame. The opposite lower ends of the outside frame 28a are fitted onto the connecting projections 29b, and the back portion 28 and the seat portion 29 are covered with a surface cover through a cushioning material such as a polyurethane foam material.

[Availability of Industrial Utilization]

According to the present invention, the roller chains are mounted in a ring shape round the upper and lower shafts in meshing with the gears mounted to the upper and lower shafts for vertical movement of the massaging ball rollers through the roller chains as described above. For that reason, there is no need for extra structures such as an empty box for receiving a taken-up belt, differently from "a double belt structure for forward and backward traveling" in the prior art. Further, since the roller chains may be moved in surely meshing with the gears mounted to the upper and lower shafts, there is no fear that the roller chains get out of place even though the roller chains are bent to some degree. Thus, there is no need for additional mechanisms for preventing the roller chains from getting out of place, differently from the prior art based on the rotation of an unbending stainless steel belt. Besides, the massaging ball rollers may be guided in accordance with the guide slits to offer various curves without the need for guide rails. As a result, it is possible to provide a simple, compact less-troubled structure.

The roller drive device according to the present invention has a size as high as the upper half of the human body, requires less volume and is lightweight. For that reason, the wider range of its application is expected by incorporating this roller drive device constantly as a unit into the seat of chair, automobile, train and plane or the like. Further, the above roller drive device may be applied to mount to the back of the seat of chair and automobile or the like simply as an individual

1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2765 2766 2767 2768 2769 2770 2771 2772 2773 2774 2775 2776 2777 2778 2779 2780 2781 2782 2783 2784 2785 2786 2787 2788 2789 2790 2791 2792 2793 2794 2795 2796 2797 2798 2799 2800 2801 2802 2803 2804 2805 2806 2807 2808

CLAIMS

1. A unit-type roller drive device of a size as approximately high as the back of the human body for motor-driven roller massage actions, comprising:

5 a frame composed of a base portion and left and right edge portions standing upright from the left and right sides of the base portion;

a longitudinal guide slit provided in each of the left and right edge portions;

10 a shaft having a gear and mounted to each of the upper and lower ends of the frame;

a roller chain mounted in a ring shape round the upper and lower shafts in meshing with said gears; and

15 a shaft bushing mounted to each roller chain and fixed to massaging ball rollers, the left and right ends of said shaft bushings being mounted in an inserted state in said guide slits;

wherein the roller chains are moved vertically by rotation of the shafts with a drive motor, and in cooperation with the vertical movement of the roller chains, the massaging ball
20 rollers are guided in accordance with the guide slits for vertical movement.

2. A unit-type roller drive device for motor-driven roller massage actions according to claim 1, wherein each shaft
25 bushing has a plate-shaped base portion fixed to the opposite ends of each roller chain and a rising piece standing upright from the surface of the base portion and is structured that a pivotal massaging ball roller mount piece is mounted to the

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rising piece, the massaging ball rollers are mounted to the massaging ball roller mount piece, pins are provided to be projecting from the back of said base portion outwardly, and the guide rollers are mounted to said pins to insert the guide roller portions into the guide slits.

3. A unit-type roller drive device for motor-driven roller massage actions according to claim 2, wherein the rising piece has a triangular shape, and the massaging ball roller mount piece has a shape like the letter V and is structured that the massaging ball rollers are mounted to the respective top ends of two-directional side pieces of said massaging ball roller mount piece, and a stopper is provided to be projecting from the surface of each of said two side pieces.

4. A unit-type roller drive device for motor-driven roller massage actions according to claim 1, 2 or 3, wherein sensors to vary the turning direction of the drive motor is provided on one side edge portion of the frame in the vicinity of the upper and lower shafts.

5. A motor-driven roller massage instrument, comprising:
a bucket-shaped base body having a concave portion provided in the center of the base body for installation of the roller drive device and left and right flexible blade piece portions formed on the left and right sides of said concave portion; and

belts mounted to the left and right blade piece portions to

fasten the user body and also to fasten the other appliance;

wherein the roller drive device according to claim 1, 2, 3 or 4 is installed in said concave portion for installation of the roller drive device.

5

6. A motor-driven roller massage instrument, comprising:
an outside frame surrounding a bucket-shaped portion on all sides; and

10 upper and lower lateral rods mounted across the left and right frame portions of the outside frame and respectively having concave portions;

wherein the roller drive device according to claim 1, 2, 3 or 4 is installed in said concave portions.

15 7. A legless chair mounted with a motor-driven roller massage instrument, comprising:

a back portion rotatably mounted to a seat portion and having an outside frame surrounding the back portion on its upper, left and right sides;

20 upper and lower lateral rods mounted across the left and right sides of the outside frame and respectively having concave portions;

wherein the roller drive device according to claim 1, 2, 3 or 4 is installed in said concave portions.

ABSTRACT

It is an object to provide a more-simplified, compact unit-type roller drive device, which permits more certain, smooth driving for motor-driven roller massage actions, and also to a
5 motor-driven roller massage instrument mounted with such a unit type roller drive device.

There is provided a roller drive device of a size as approximately high as the back of the human body. The roller drive device has a frame composed of a base portion and left and
10 right edge portions standing upright from the left and right edges of the base portion, and a longitudinal guide slit is provided in each of the left and right edge portions. A shaft having a gear is mounted to each of the upper and lower ends of the frame, and a roller chain is mounted in a ring shape round
15 the upper and lower shafts in meshing with the gears. A shaft bushing fixed to massaging ball rollers is mounted to the roller chain, and the left and right ends of the shaft bushings are mounted in an inserted state in the guide slits. With the above structure, the roller chains are moved vertically by rotation of
20 the shafts with a drive motor. There is also provided a motor-driven roller massage instrument mounted with such a roller drive device.

FIG. 1

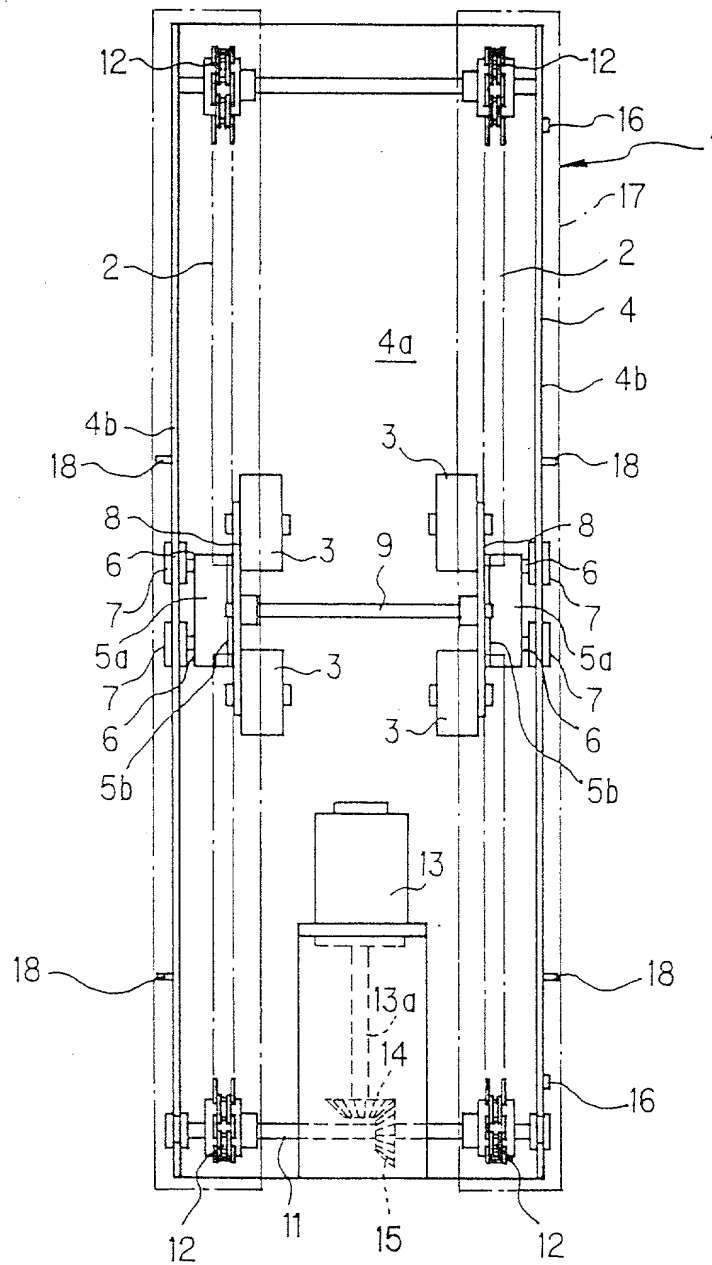


FIG. 2

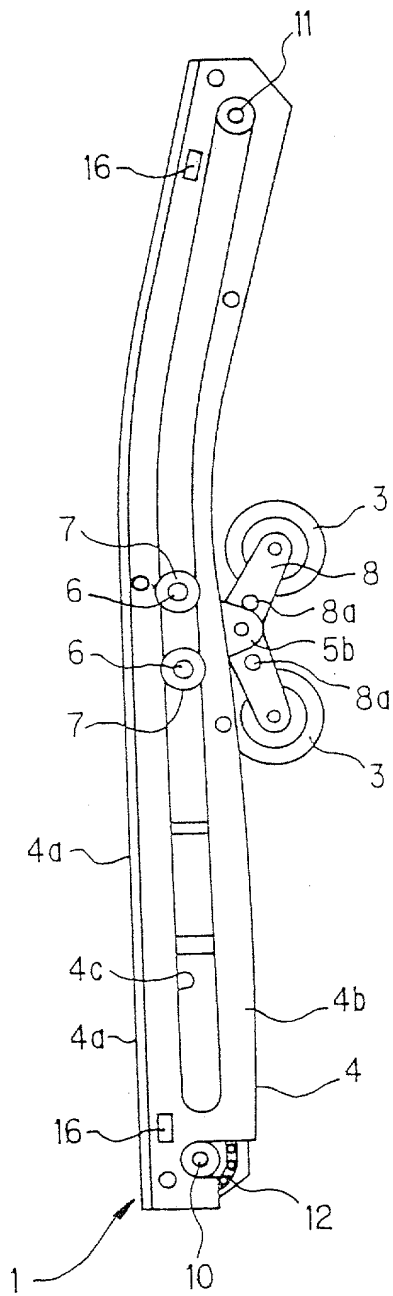


FIG. 3

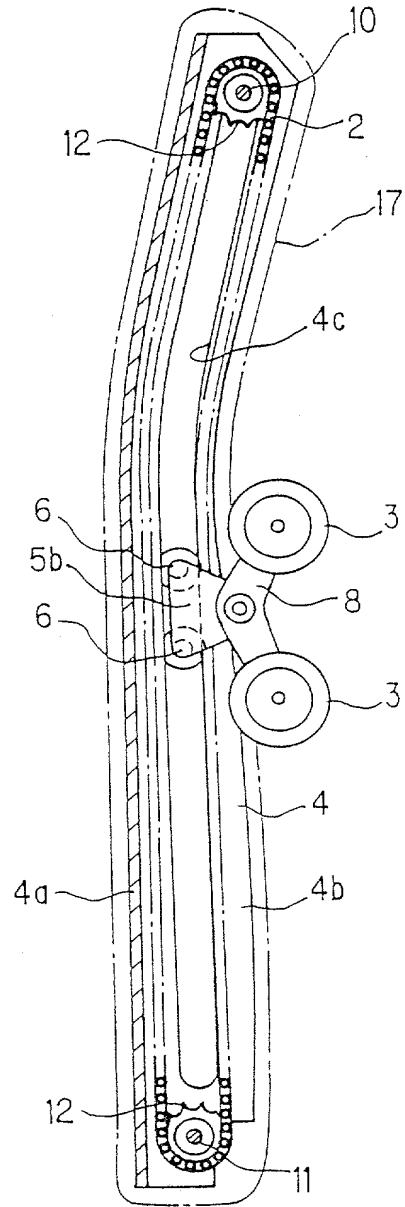


FIG. 4

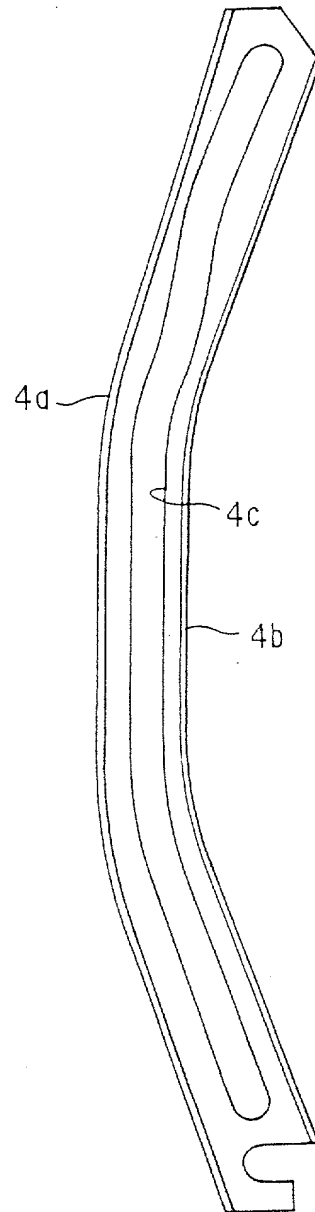


FIG. 5

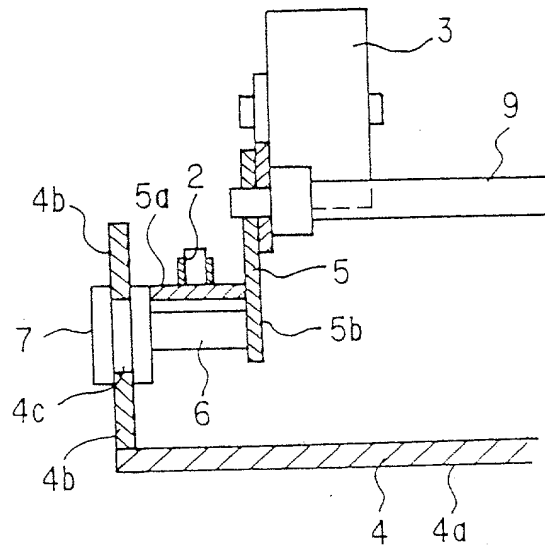


FIG. 6

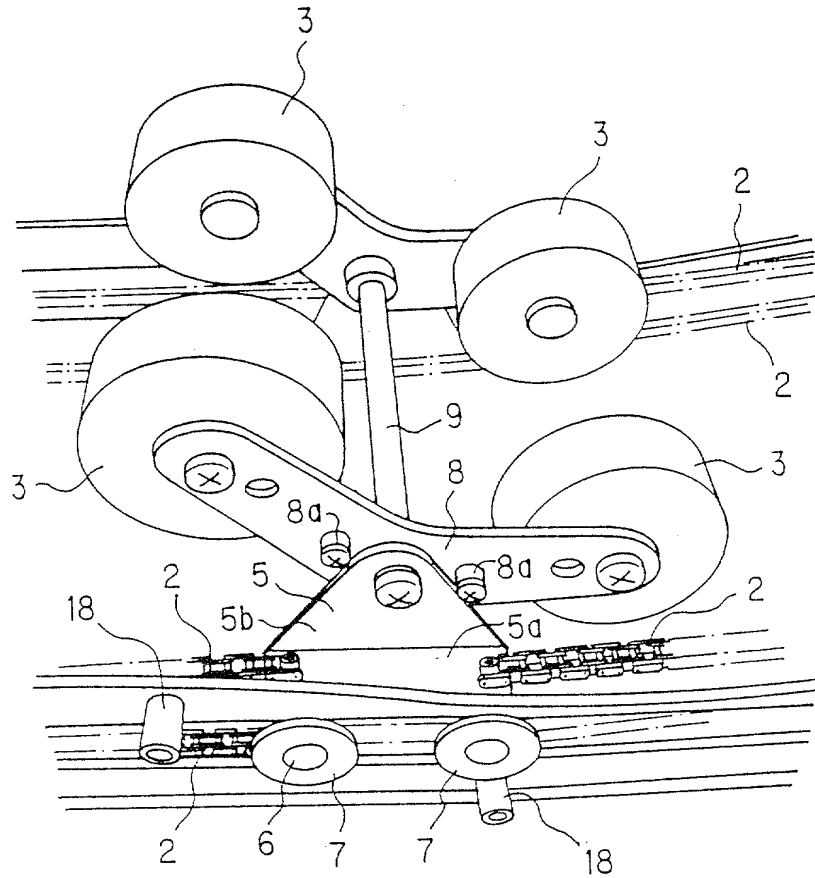


FIG. 7

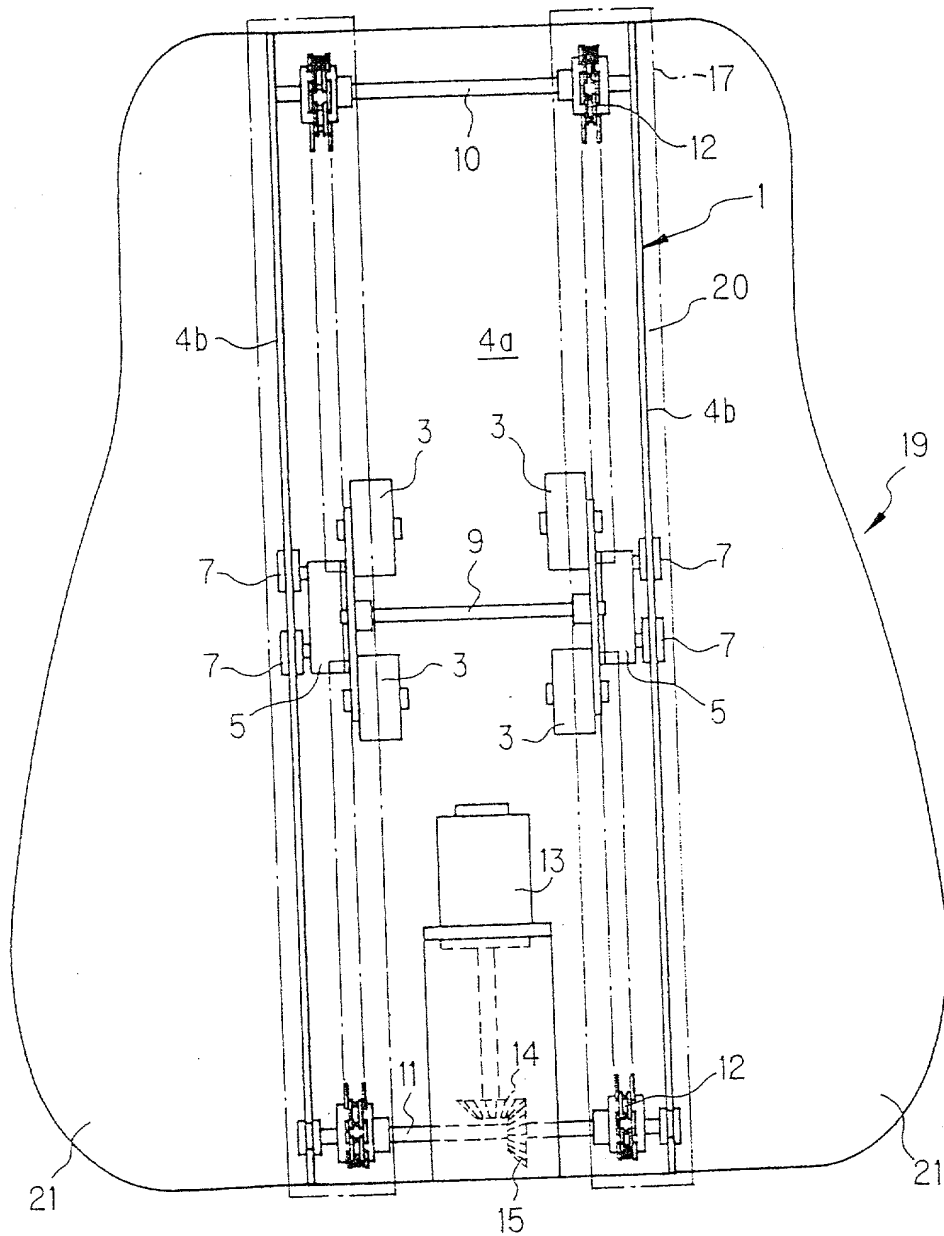


FIG. 8

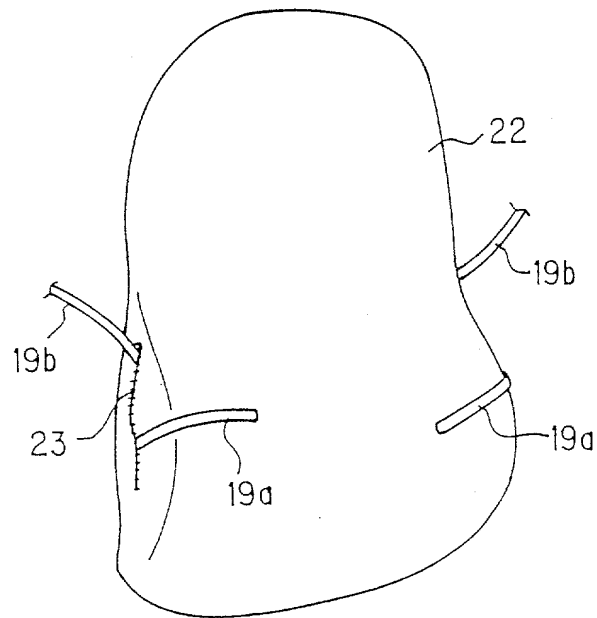


FIG. 9

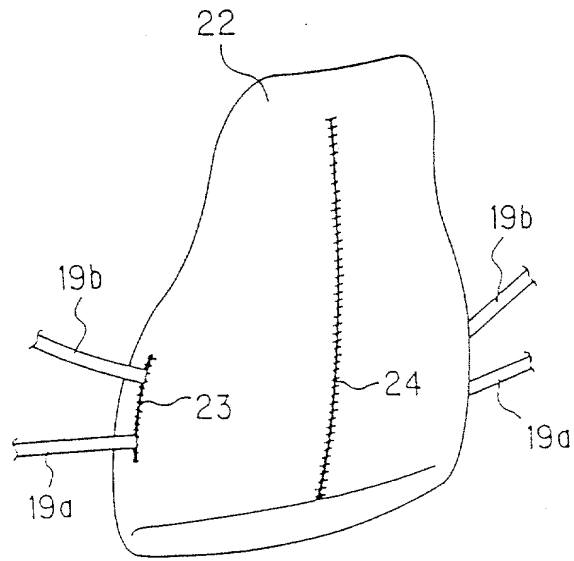


FIG. 10

